SVP066E Six-Channel SD Video Capture Card User Manual V1.02

Solution

Application Note

Datasheet

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Version History

Version	Date	Add/Del/Rev
V1.00	2011-3-16	New version
V1.01	2012-2-11	Add audio equipment description explanation
V1.02	2012-6-18	Modify product manual according to the systech template format

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1 Preface

Thank you for purchasing SVP066E 6-channel audio and video capture adapter!

SVP066E is featured with small and exquisite bulk, superior performance. The SVP066E can simultaneously capture six Standard-Definition video signals, and six stereo analog audio signals.

The user's guide will provide with necessary instruction for proper use of SVP066E capture adapter.

2 Product introduction

2.1 Product Feature

- Simultaneously capture six Standard-Definition video signals, and six stereo analog audio signals.
- Be compatible with Video Standard PAL, NTSC.
- Microsoft AV Stream standard driver, support most multi-media video software or stream media software.
- Smallest size: 123mm x 64.5mm, up to Low-Profile specification.

2.2 Advanced Feature

- DMA transmission with high performance.
- Multi-Channel audio/video data transmission flow equalizing faction to stop drawing picture phenomenon.
- Deinterlace supports Vertial Blend and Motion Adaptive.
- Hardware color conversion, it can output RGB24，RGB32，YUY2，UYVY，I420.

- The firmware can upgrade.

2.3 Product Specifications

Board Size	123mm x 64.5mm
Host Interface	PCI-Express x1, Low Profile, 200MB/s transmission bandwidth
Input Interface	DB25 interface(connect with six CVBS, six unbalance stereo analog audio signals)
Maximum Sampling Rate	54MHz (4x Oversampling)
Video Sampling	10 bit
Onboard Memory	128MB DDR2, 160 MHz of working frequency, 32bit of bit wide
Output Image Format	Size: 176x144-768x576, frame rate: 1-30 fps, color: YUY2, UYVY, RGB24, RGB32, I420
Operating System Support	Support following operating systems (x 86 version or x64 version) : Windows® XP Professional Windows® Server 2003 Windows Vista®, Windows® Server 2008 Windows® 7 Windows® Server 2008 R2
Power Consumption	<= 8W
Operating Temperature	0 to 50 deg C
Storage Temperature	-20 to 70 deg C
Relative Humidity	5% to 90%

Table 1 SVP066E Six-Channel SD Video Capture Card Product Specifications

[Please note]:

1. PCI-Express actual transmission bandwidth relates with the host chipsets and motherboard, it may be lower than written value here.
2. The actual output frame rate is limited by PCI-Express interface bandwidth, it may be less than setting value.

3 Minimum Hardware Configuration

- Intel Core Solo
- 1G of RAM
- Available PCI-Express x1 expansion slot on motherboard

4 Recommended Hardware Configuration

- Intel Core i5
- 2G of RAM
- Available PCI-Express x1 expansion slot on motherboard

5 System Requirements

System should be one of the following systems (x 86 version or x64 version):

- Microsoft Windows XP
- Microsoft Windows Server 2003
- Microsoft Windows Vista
- Microsoft Windows Server 2008
- Microsoft Windows 7
- Microsoft Windows Server 2008 R2

6 Hardware and Driver Installation

Please contrast parts list and parts in package to confirm that there is no lack of any parts.

6.1 Parts List

Parts	Number
SVP066E Capture Card	1
DB-25 to Audio/Video Breakout Cable	1
Low-Profile Baffle	1
Driver Installation CD	1
Product Manual (the document)	1

Table 2 SVP066E Six-Channel SD Video Capture Card Parts List

6.2 Install SVP066E

1. Power off the computer.
2. Discharge any static electricity build up in your body by touching a large grounded metal surface or the computers' case (if plugged in) for few seconds; or wear an antistatic wrist strap.
3. Put SVP066E into the computer PCI-Express slot.SVP066E can be putted into PCI Express x1, x4 or x16 slot. (Note: the x16 slot in some motherboard is exclusive use for graphics card, the capture card may be not identified correctly)
4. Power on the computer to start the operating system.
5. Cancel the "find new hardware" image that the operating system prompts.
6. Insert the driver CD-ROM and run Autorun.exe in CD-ROM root directory.
7. Click the installation program and follow prompts to carry on remaining operations.
8. Run the demo program in CD to check whether success after installation.

7 Connection of Input

7.1 SD Video Signal(CVBS)

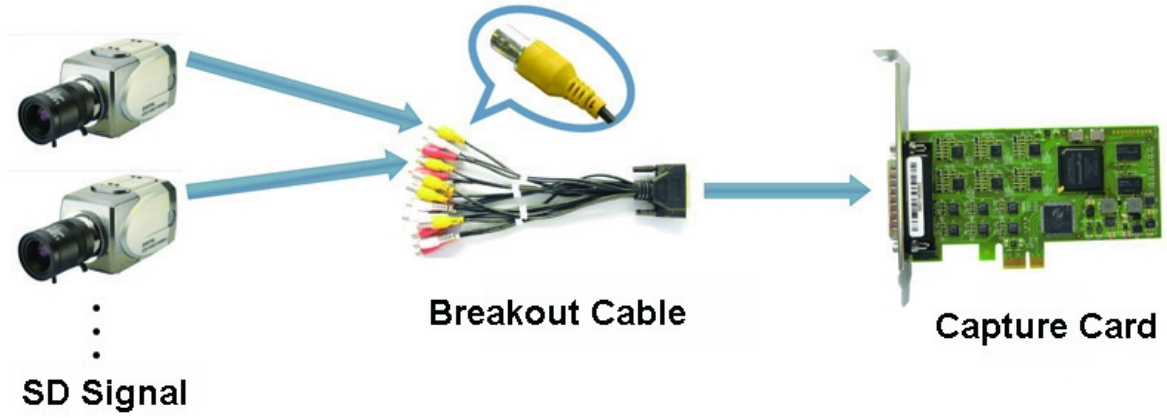


Figure 1, SD video signal connection sketch map

7.2 Audio Signal

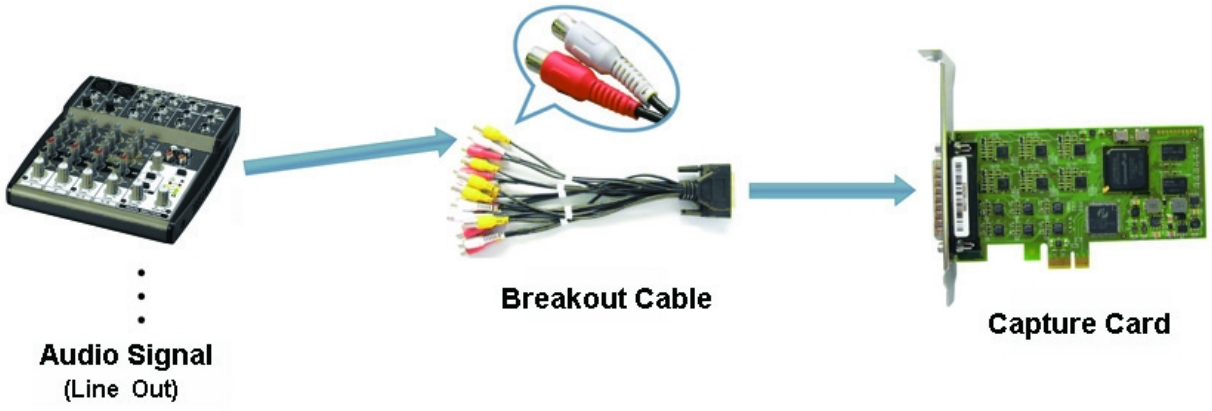


Figure 2, Audio signal connection sketch map

[Notes]:

The audio signal input is up to" **Line in**" level standard, if you need to connect to microphone, must connect microphone with microphone input of "**microphone amplifier**" or "**mixer**", and then "**microphone amplifier**" or "**mixer**" output is connected to the interface.

8 Video Capture Device Instruction

SVP066E is based on Microsoft DirectShow interface, six video capture devices will be increased in operating system after installation:

- Video 1 (SVP066E Adapter x)
- Video 2 (SVP066E Adapter x)
- Video 3 (SVP066E Adapter x)
- Video 4 (SVP066E Adapter x)
- Video 5 (SVP066E Adapter x)
- Video 6 (SVP066E Adapter x)

The Video 1 to 6(SVP066E Adapter x) is corresponding to yellow video BNC interface with the same number in breakout cable.

SVP066E not only offers basic options, such as image brightness, contrast, hue, saturation, Gamma and so on, but also provides additional options for setting function. You can use "**Filter Properties dialog window**" in DirectShow to set options.

8.1 Display "Filter Properties Dialog Window" In Common Software

AMCAP: Double click "**AmCap.exe**", choose SD video device "**Video 1 (**SVP066E **Adapter1)**" in "**Devices**" menu, then click "**Video Capture Filter ...**" in "**Settings**" menu, pop-up " **Filter Properties dialog window**".

8.2 “Device” Instruction

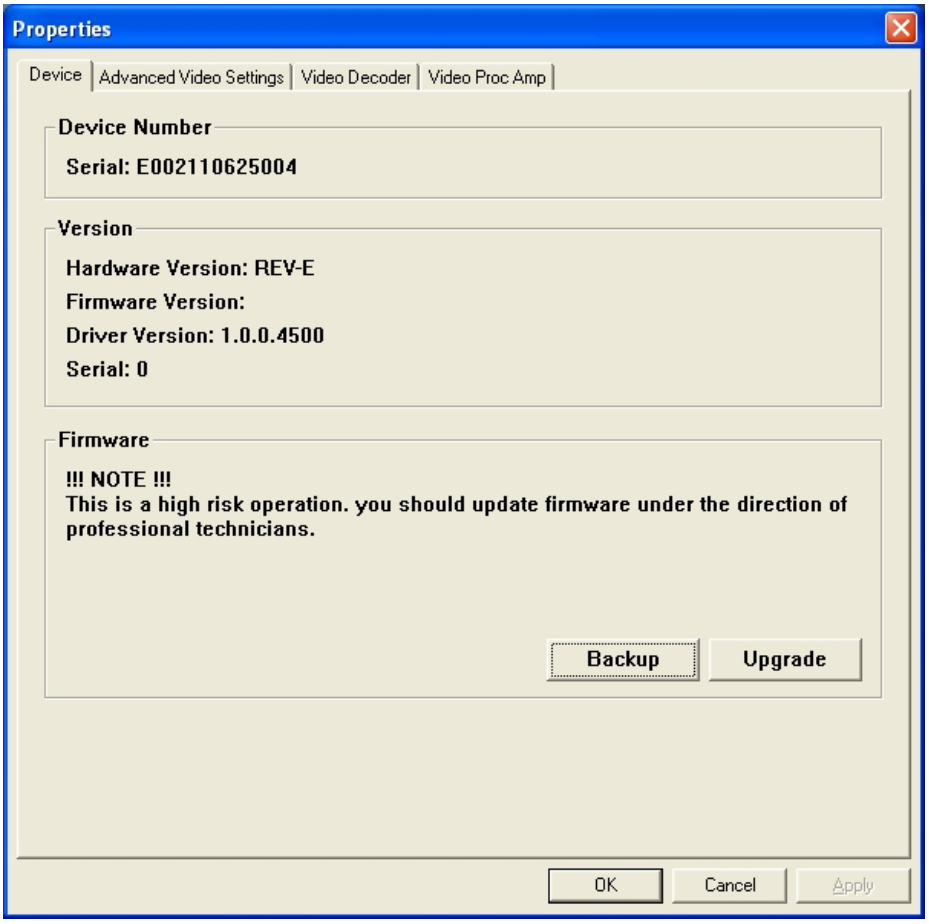


Figure 3, Device Properties tab

Device Number: display serial of card, the number should be accorded with the barcode on the card.

Version: display related version number, versions include hardware version, firmware version, driver version, and device serial. You may request user to provide relevant version number when you solve problems.

Firmware: if new features need to upgrade the firmware, we should first backup it and then upgrade the firmware.

[Notes]:

The different versions of the firmware and hardware cannot be mixed together, or else it will get error when upgrade. Additionally, do not power outage in the process of firmware upgrade,

otherwise it will lead to upgrade firmware fail, then the capture card will not work. You have to return the capture card back to factory for being repaired.

8.3 Capture Device "Advanced Settings" Instruction

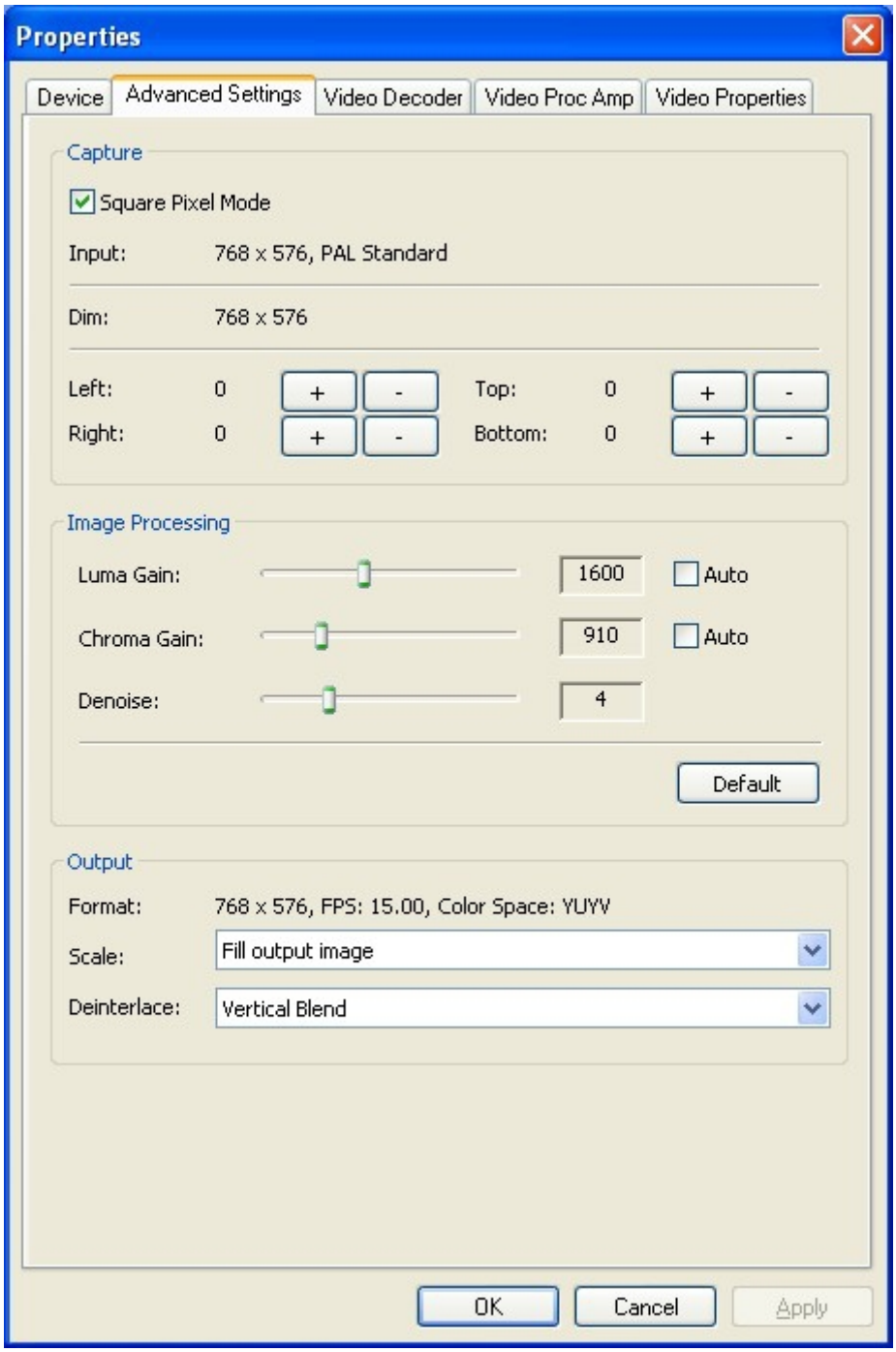


Figure 4, "Advanced Settings" page

8.3.1 Capture

Square Pixel Mode: image is not deformation, XY pixel and aspect ratio are both 4:3, PAL input is 768x576, NTSC input is 640x480, square pixel mode is default.

Non Square Pixel Mode: image is a little deformation, PAL input is 720x576,NTSC input is 720x480.

Input: dimension, model.

Dim: when image is not clipped, capture dimension is the same as input, if image is clipped, it will display dimension of image clipping.

Image Cutting: Through adjust up and down around the boundary to cut off image, such as, the bottom has black edging, click bottom"+" to clip. The step size of 2 pixels, if you want recovery, click top"-" .

Notes: when you clip image, please set scale "Fill output image" to watch clipping effect conveniently.

8.3.2 Image Processing

Generically, default value need not adjust, but in different environments if image brightness, color, noise cannot reach best, you can fine-tune to achieve best.

Luma Gain: Default value is 1600, increasing or decreasing brightness according to requirement. If you choose "**Auto**", image brightness will be dynamically auto according to input signal.

Chroma Gain: Default value is 910, adjust image to black and white, raise image color to be more and more bright. If check "**Auto**", image color will be dynamically auto according to input signal.

Denoise: 4 is default, if image noise is more, you can raise denosie, image noise will be significantly less, but image definition is slightly worse.

8.3.3 Image Output

Display output format of current image, set image zoom scale, deinterlace and image flipping.

- Format: display output image size, frame rate, color format.

- Scale: if image size is not unified with user setting, we provide three ways, full output image and keep aspect ratio, fill border to black and keep aspect ratio, clip border. Full output image and keep aspect ratio is default.
- Deinterlace: vertial blend, motion adaptive. Motion adaptive is better, but it takes up high CPU usage, also you can choose “disabled”.

9 Video Formats Setting

Driver is redefined "**Filter Output Pin**" interface. Output resolution can be any size, even special resolution which is cut.

9.1 Display "Filter Output Pin" In Common Software

- **AMCAP:** Double click "**AmCap.exe**", choose HD video device "**HD Video (SVP066E Adapter1)**" in "**Devices**" menu, then click “**Video Capture Pin ...**”in "**Settings**" menu, pop-up " **Filter Output Pin** ".

9.2 “Out Format” Instruction

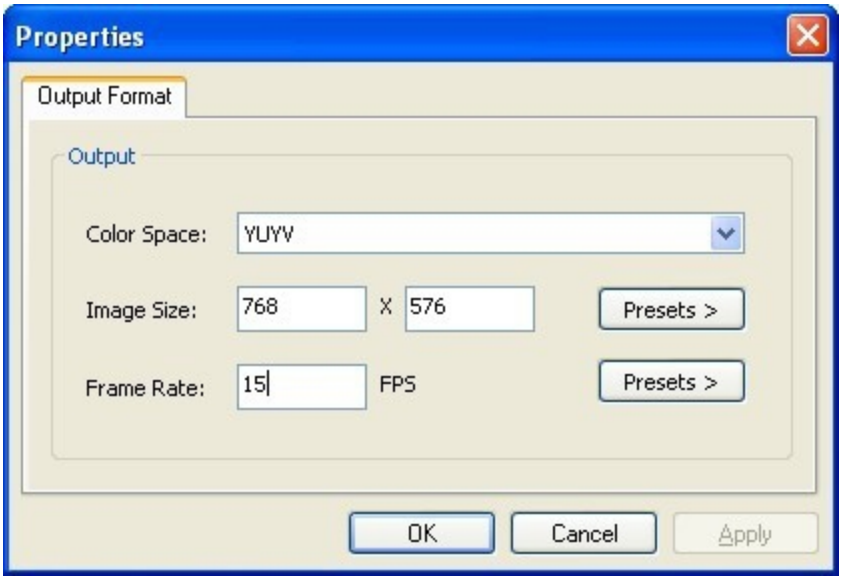


Figure 5, “Properties” page

Color Space: offer five color formats, YUYV, UYVY, I420, RGB 24 Bits, and RGB 32 Bits.

Image Size: set image size of output, it can be written manually, or select output resolution from "**Presets**", the bold font resolution at the top is the same as capture image, it is the best resolution.

Frame Rate: set output frame rate, you can writer manually, or select from "**Presets**". If application software is set output frame rate, now setting is no effect, when you open again, it will return frame rate in application software.

10 Audio Capture Device Instruction

SVP066E is based on the Microsoft DirectShow interface. After installation in operating system, the relevant audio devices will be added on. Any software which is compatible with DirectSound, DirectShow can use the recording device for capturing sound.

10.1 Windows XP, Windows 2003

The name of audio capture device under Windows XP, Windows 2003:

- Audio 1 (SVP066E Adapter x)
- Audio 2 (SVP066E Adapter x)
- Audio 3 (SVP066E Adapter x)
- Audio 4 (SVP066E Adapter x)
- Audio 5 (SVP066E Adapter x)
- Audio 6 (SVP066E Adapter x)

Through system "**Volume Control**" to adjust recording volume, detailed steps as follows:

1. In system notification icon area on right corner double-click " " button to pop-up "**Open Volume Control**" window.
2. Open "**Options**" menu, select "**Properties**" menu item.
3. In "**Mixer**", select "**Audio 1 (SVP066E Adapter x)**", click "**OK**" button.
4. Corresponding volume control project will be displayed, this time you can operate volume and "**quiet**" according to your requirement.

Figure 6， Windows XP/2003"VolumeControl"-"Properties" dialogue

10.2 Windows Vista, Windows 7, Windows 2008, Windows 2008 R2

Under such operating systems, each capture card will show two audio capture devices:

- Audio 1 SVP066E Adapter x
- Audio 2 SVP066E Adapter x
- Audio 3 SVP066E Adapter x
- Audio 4 SVP066E Adapter x
- Audio 5 SVP066E Adapter x
- Audio 6 SVP066E Adapter x

Through system "**Volume Control**" to adjust the recording volume, specific steps as follows:

1. In system notification icon area on right corner right-click " "button, select "**Recording devices**" in pop-up menu.
2. In pop-up list which displays recording device, select " **Audio 1 SVP066E Adapter x** ", click "**Properties**" button, system will pop up device properties dialog window.
3. In Properties dialog box, select "**Levels**" property page, then you can operate volume control and "**Quiet**" according to your requirement.

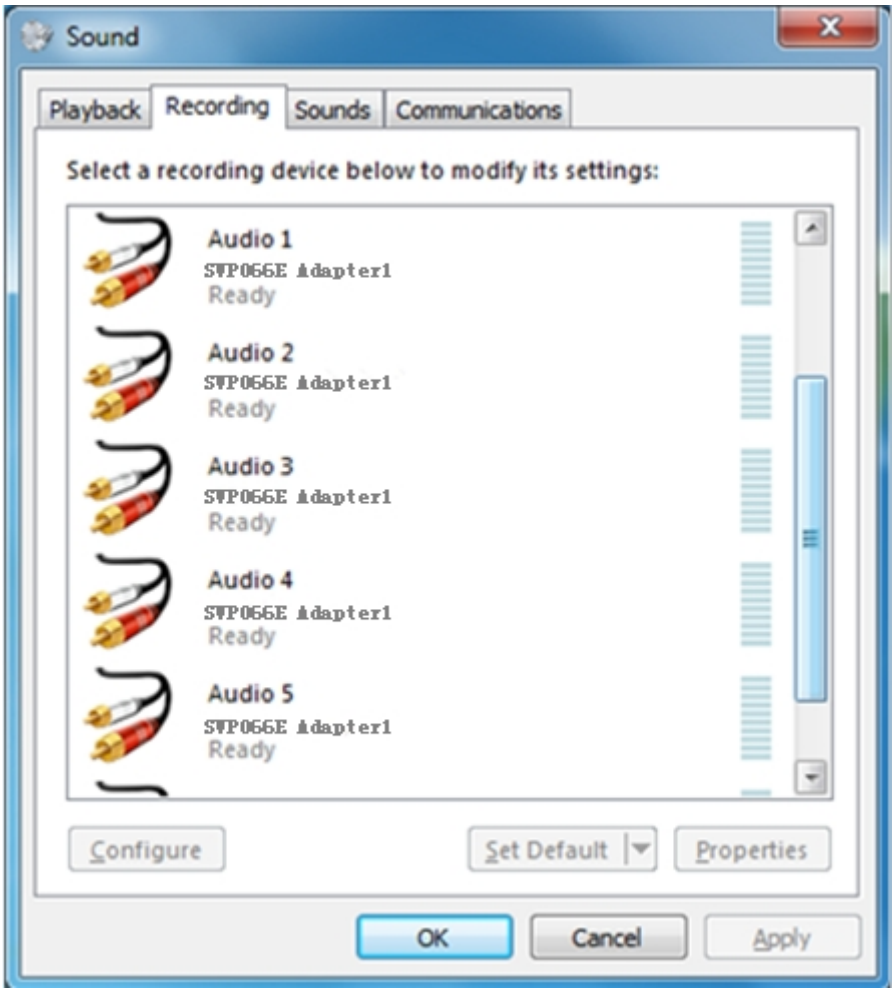


Figure 7, Windows Vista/7 recording device properties dialog windows

11 Compatible Software Instruction

SVP066E can be compatible with variety of audio and video capture software which is based DirectShow interface, and audio capture software which is based DirectSound interface, such as:

- Windows Media Encoder
- Adobe Flash Media Live Encoder
- Real Producer Plus
- Video LAN for Windows

Appendix

A. Related Documents

Appendix 1. Cyclone IV E components serial resources

resource	EP4CE6	EP4CE10	EP4CE15	EP4CE22	EP4CE30	EP4CE40	EP4CE55	EP4CE75	EP4CE115
Logical unit (LE)	6, 272	10, 320	15, 408	22, 320	28, 848	39, 600	55, 856	75, 408	114, 480
Embedded memory(Kbits)	270	414	504	594	594	1, 134	2, 340	2, 745	3, 888
Embedded 18*18 multiplying unit	15	23	56	66	66	116	154	200	266
Interchangeable PLL	2	2	4	4	4	4	4	4	4
Global clock networks	10	10	20	20	20	20	20	20	20
User I/O piece	8	8	8	8	8	8	8	8	8
Maximum user I/O (Note 1)	179	179	343	153	532	532	374	426	528

[Note]:

User I / O pins in pin list file include all common I / O pins, dedicated clock pins and dual- configuration pins. Transceiver pins and dedicated configuration pins are not included in the pin list.

Appendix 2. Cyclone IV E components Packaging Products

Package	E144		M164		U256		F256		U484		F484		F780	
Size(mm)	22 × 22		8 × 8		14 × 14		17 × 17		19 × 19		23 × 23		29 × 29	
Pacing(mm)	0.5		0.5		0.8		1.0		0.8		1.0		1.0	
Devices	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)	User I/O	LVDS(Note 2)
EP4CE6	↑91	21	—	—	↑179	66	↑179	66	—	—	—	—	—	—
EP4CE10	91	21	—	—	179	66	179	66	—	—	—	—	—	—
EP4CE15	81	18	↕89	21	165	53	165	53	—	—	↑343	137	—	—
EP4CE22	↓79	17	—	—	↓153	52	↓153	52	—	—	—	—	—	—
EP4CE30	—	—	—	—	—	—	—	—	—	—	328	124	↑532	224
EP4CE40	—	—	—	—	—	—	—	—	↑328	124	328	124	532	224
EP4CE55	—	—	—	—	—	—	—	—	324	132	324	132	374	160
EP4CE75	—	—	—	—	—	—	—	—	↓292	110	292	110	426	178
EP4CE115	—	—	—	—	—	—	—	—	—	—	↓280	103	↓528	230

[Note]:

(1) E144 package has an exposed substrate at the bottom, the exposed substrate connect ground ,it must be connected to the PCB ground surface. Use it for for circuit connection, rather than for temperature processing purposes.

(2) that includes a dedicated LVDS pairs, including pseudo-LVDS pairs. For more information.

Appendix 3. Cyclone IV E components series of speed grade

Devices	E144	M164	U256	F256	U484	F484	F780
EP4CE6	C8L, C9L, I8L C6, C7, C8, I7, A7	—	I7N	C8L, C9L, I8L C6, C7, C8, I7, A7	—	—	—
EP4CE10	C8L, C9L, I8L C6, C7, C8, I7, A7	—	I7N	C8L, C9L, I8L C6, C7, C8, I7, A7	—	—	—
EP4CE15	C8L, C9L, I8L C6, C7, C8, I7	I7N	I7N	C8L, C9L, I8L C6, C7, C8, I7, A7	—	C8L, C9L, I8L C6, C7, C8, I7, A7	—
EP4CE22	C8L, C9L, I8L C6, C7, C8, I7, A7	—	I7N	C8L, C9L, I8L C6, C7, C8, I7, A7	—	—	—
EP4CE30	—	—	—	—	—	C8L, C9L, I8L C6, C7, C8, I7, A7	C8L, C9L, I8L C6, C7, C8, I7
EP4CE40	—	—	—	—	I7N	C8L, C9L, I8L C6, C7, C8, I7, A7	C8L, C9L, I8L C6, C7, C8, I7
EP4CE55	—	—	—	—	I7N	C8L, C9L, I8L C6, C7, C8, I7	C8L, C9L, I8L C6, C7, C8, I7
EP4CE75	—	—	—	—	I7N	C8L, C9L, I8L C6, C7, C8, I7	C8L, C9L, I8L C6, C7, C8, I7
EP4CE115	—	—	—	—	—	C8L, C9L, I8L C7, C8, I7	C8L, C9L, I8L C7, C8, I7

[Note]:

(1) C8L, C9L and I8L speed grade for 1.0 V core voltage.

(2) C6, C7, C8, I7, and A7 speed grades for 1.2 V core voltage.

Appendix 4. Cyclone IV components series of M9K module data width

Model	Date width settle
Single-port or simple Dual-port	×1, ×2, ×4, ×8/9, ×16/18, 和 ×32/36
True Dual-port	×1, ×2, ×4, ×8/9, 和 ×16/18

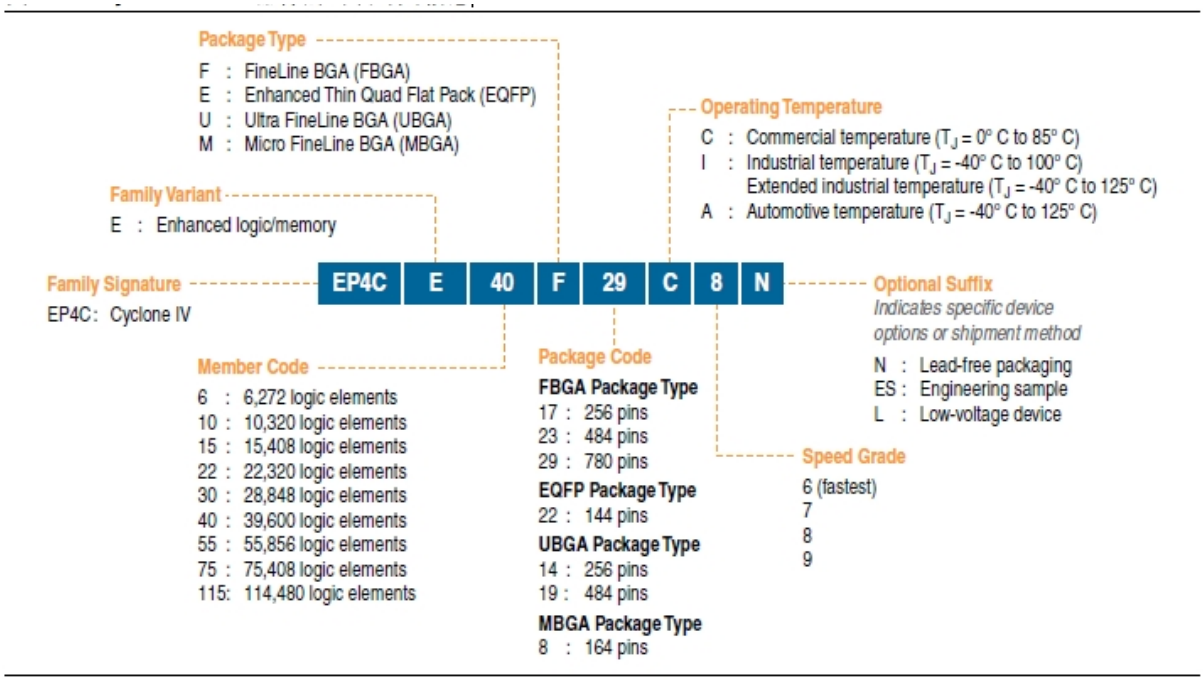
Appendix 5. Cyclone IV components series support I/O standard

Model	I/O standard
Single-port I/O	LVTTL, LVCMOS, SSTL, HSTL, PCI, 和 PCI-X
Differential I/O	SSTL, HSTL, LVPECL, BLVDS, LVDS, mini-LVDS, RSDS, and PPDS

Appendix 6. Cyclone IV components serial configuration solution

Devices	Supported configuration solution
Cyclone IV GX	AS, PS, JTAG, and FPP (Note 1)
Cyclone IV E	AS, AP, PS, FPP, and JTAG

Appendix 7. Cyclone IV components package products information


Package Type
F : FineLine BGA (FBGA)
E : Enhanced Thin Quad Flat Pack (EQFP)
U : Ultra FineLine BGA (UBGA)
M : Micro FineLine BGA (MBGA)
Family Variant
E : Enhanced logic/memory
Operating Temperature
C : Commercial temperature (TJ = 0° C to 85° C)
I : Industrial temperature (TJ = -40° C to 100° C)
Extended industrial temperature (TJ = -40° C to 125° C)
A : Automotive temperature (TJ = -40° C to 125° C)
Family Signature
EP4C: Cyclone IV
EP4C E 40 F 29 C 8 N
Optional Suffix
Indicates specific device options or shipment method
N : Lead-free packaging
ES : Engineering sample
L : Low-voltage device
Member Code
6 : 6,272 logic elements
10 : 10,320 logic elements
15 : 15,408 logic elements
22 : 22,320 logic elements
30 : 28,848 logic elements
40 : 39,600 logic elements
55 : 55,856 logic elements
75 : 75,408 logic elements
115: 114,480 logic elements
Package Code
FBGA Package Type
17 : 256 pins
23 : 484 pins
29 : 780 pins
EQFP Package Type
22 : 144 pins
UBGA Package Type
14 : 256 pins
19 : 484 pins
MBGA Package Type
8 : 164 pins
Speed Grade
6 (fastest)
7
8
9

B. Terms and Abbreviations

Abbreviation	Description
PAL	Phase Alternating Line
NTSC	National Television Standards Committeer
DMA	Direct Memory Access

C. Safety Caution

In the process of use or repair any equipment by SYSTECH need to pay attention to the following safe guard. Terminal equipment shall inform the security of user information below. Otherwise, SYSTECH technology will not bear any because the user did not press these warnings and consequences.

Contact us:

SYSTECH
Address: 702, Block A, Tsinghua Hi-Tech Park, Nanshan, Shenzhen, China
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